



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,676	09/30/2003	Marc A. Najork	MSFT-2557/304882.01	4999
41505	7590	03/28/2006	EXAMINER	
WOODCOCK WASHBURN LLP (MICROSOFT CORPORATION)			STACE, BRENT S	
ONE LIBERTY PLACE - 46TH FLOOR			ART UNIT	
PHILADELPHIA, PA 19103			PAPER NUMBER	
			2161	
DATE MAILED: 03/28/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/674,676

Applicant(s)

NAJORK ET AL.

Examiner

Brent S. Stace

Art Unit

2161

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>20060315</u> . | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2161

DETAILED ACTION

Remarks

1. Claims 1-56 have been examined. Claims 1-56 have been rejected. This document is the first Office action on the merits.

Information Disclosure Statement

2. The information disclosure statement is being considered by the examiner.

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "300," "302," "304," and "306" of Fig. 2B have been used to designate different items of Figs. 3A-3F. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. Since the lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors, Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the drawings. For example, the drawings should be carefully checked to ensure that all reference numerals are described in the specification, that no one reference numeral describes two separate drawing elements, or that the specification contains no reference to numerals not in the drawings.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

Art Unit: 2161

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 8, 18, 36, and 44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 8, 18, 36, and 44 recite "...after the data transaction commits." The examiner only sees support in the specification for the hypothetical limitation "...before the data transaction commits" (see paragraphs [0064] and [0067] of respective pages 20 and 21 of the present application).

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claims 1-22, 24-46, and 48-55 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

11. Claims 1, 12, 22, 29, 38, 46, 51, 53, and 55 recite what appears to be an intended result of "recovering by re-performing data transactions" in the preamble. This recovery operation result is not reflected in Claims 2-11, 13-21, 24-28, 30-37, 39-45, 48-50, 52, or 54. Claims 23, 47, and 56 appear to fix the lacking result for their appropriate claims they respectfully depend on, however the 35 U.S.C. 101 rejection is only fixed for those claims.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 1-21, 29-45, and 51-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,485,608 (Lomet et al.) in view of Efficient Locking for Concurrent Operations on B-Trees (Lehman et al.).

15. For **Claim 1**, Lomet teaches: "A method for logging while updating ... via a plurality of data transactions, [Lomet, col. 7, lines 26-34] whereby a current state of the data structure is recovered by re-performing data transactions represented by the logging, [Lomet, col. 20, lines 36-44 with Lomet, col. 21, lines 40-50] comprising:

Art Unit: 2161

- generating at least one log entry corresponding to a data transaction of the plurality of data transactions, the data transaction to be carried out on said B-link tree; [Lomet, col. 22, lines 25-30 with Lomet, col. 19, lines 35-37] and
- storing said at least one log entry into a log" [Lomet, col. 19, lines 35-37].

Lomet discloses the above limitations but does not expressly teach:

- "a B-link tree."

With respect to Claim 1, an analogous art, Lehman, teaches:

- "a B-link tree" [Lehman, p. 657, section 3.3].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Lehman with Lomet because both inventions are directed towards storing information in a database.

Lehman's invention would have been expected to successfully work well with Lomet's invention because both inventions use databases. Lomet discloses methods and an apparatus for updating information in a computer system using logs and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet does not expressly disclose the use of a B-link-tree to store the data in the database of Lomet. Lehman discloses efficient locking for concurrent operations on B-trees comprising a B-link-tree.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the b-link-tree from Lehman and install it into the invention of Lomet, thereby offering the obvious advantage of a guaranteed small (average) search, insertion, and deletion time for the database of Lomet.

Art Unit: 2161

16. **Claim 2** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including periodically truncating the log" [Lomet, cols. 11-12, lines 60-12].
17. **Claim 3** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, wherein said at least one log entry includes at least one of (A) at least one entry from an allocation layer and (B) at least one entry from a B-link tree layer" [Lomet, col. 19, lines 35-37 with Lehman, p. 657, section 3.3].
18. **Claim 4** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including discarding said at least one log entry from the log when the data transaction has been carried out on said B-link tree" [Lomet, col. 14, lines 9-12].
19. **Claim 5** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, wherein said storing includes storing said at least one log entry into the log before the data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34].
20. **Claim 6** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including caching data of said data transaction before said data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34 with Lomet, col. 5, lines 1-11].
21. **Claim 7** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including storing said at least one log entry in an

Art Unit: 2161

intermediate memory previous to storing said at least one log entry in the log" [Lomet, col. 7, lines 26-34 with Lomet, col. 19, lines 35-37].

22. **Claim 8** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 7, wherein said at least one log entry is moved from intermediate memory to the log after the data transaction commits" [Lomet, col. 16, lines 23-25].

23. **Claim 9** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including maintaining a log sequence number with each of said at least one log entry, uniquely identifying said at least one log entry" [Lomet, col. 5, lines 44-52].

24. **Claim 10** encompasses substantially the same scope of the invention as that of Claim 1, in addition to computer readable medium and some executable instructions for performing the method steps of Claim 1. Therefore, Claim 10 is rejected for the same reasons as stated above with respect to Claim 1.

25. **Claim 11** encompasses substantially the same scope of the invention as that of Claim 1, in addition to a modulated data signal and some executable instructions for performing the method steps of Claim 1. Therefore, Claim 11 is rejected for the same reasons as stated above with respect to Claim 1.

26. For **Claim 12**, Lomet teaches: "A method for logging while updating ... via a plurality of data transactions, [Lomet, col. 7, lines 26-34] whereby a current state of the data structure is recovered by re-performing data transactions represented by the logging, [Lomet, col. 20, lines 36-44 with Lomet, col. 21, lines 40-50] comprising:

Art Unit: 2161

- generating at least one log entry corresponding to a data transaction of the plurality of data transactions, the data transaction to be carried out on said B-link tree; [Lomet, col. 19, lines 35-37 with Lomet, col. 19, lines 45-51]
- storing said at least one log entry into a finite log; [Lomet, col. 19, lines 45-51]
- periodically flushing data corresponding to data transactions represented by the finite log to persistent storage; [Lomet, col. 14, lines 9-17] and
- truncating said finite log in coordination with said flushing" [Lomet, col. 14, lines 9-17].

Lomet discloses the above limitations but does not expressly teach:

- "a B-link tree."

With respect to Claim 12, an analogous art, Lehman, teaches:

- "a B-link tree" [Lehman, p. 657, section 3.3].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Lehman with Lomet because both inventions are directed towards storing information in a database.

Lehman's invention would have been expected to successfully work well with Lomet's invention because both inventions use databases. Lomet discloses methods and an apparatus for updating information in a computer system using logs and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet does not expressly disclose the use of a B-link-tree to store the data in the database of Lomet. Lehman discloses efficient locking for concurrent operations on B-trees comprising a B-link-tree.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the b-link-tree from Lehman and install it into the invention of Lomet, thereby offering the obvious advantage of a guaranteed small (average) search, insertion, and deletion time for the database of Lomet.

27. **Claim 13** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, wherein said at least one log entry includes at least one of (A) at least one entry from an allocation layer and (B) at least one entry from a B-link tree layer" [Lomet, col. 19, lines 35-37 with Lehman, p. 657, section 3.3].

28. **Claim 14** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, further including discarding said at least one log entry from the finite log when the data transaction has been carried out on said B-link tree" [Lomet, col. 14, lines 9-17].

29. **Claim 15** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, wherein said storing includes storing said at least one log entry into the finite log before the data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34].

30. **Claim 16** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including caching data of said data transaction before said data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34 with Lomet, col. 5, lines 1-11].

31. **Claim 17** can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, further including storing said at least one log entry in an

Art Unit: 2161

intermediate memory previous to storing said at least one log entry in the finite log”

[Lomet, col. 7, lines 26-34 with Lomet, col. 19, lines 35-37].

32. **Claim 18** can be mapped to Lomet (as modified by Lehman) as follows: “A method according to claim 17, wherein said at least one log entry is moved from intermediate memory to the finite log after the data transaction commits” [Lomet, col. 16, lines 23-25].

33. **Claim 19** can be mapped to Lomet (as modified by Lehman) as follows: “A method according to claim 12, further including maintaining a log sequence number with each of said at least one log entry, uniquely identifying said at least one log entry” [Lomet, col. 5, lines 44-52].

34. **Claim 20** encompasses substantially the same scope of the invention as that of Claim 12, in addition to computer readable medium and some executable instructions for performing the method steps of Claim 12. Therefore, Claim 20 is rejected for the same reasons as stated above with respect to Claim 12.

35. **Claim 21** encompasses substantially the same scope of the invention as that of Claim 12, in addition to a modulated data signal and some executable instructions for performing the method steps of Claim 12. Therefore, Claim 21 is rejected for the same reasons as stated above with respect to Claim 12.

36. **Claims 29 and 30** encompass substantially the same scope of the invention as that of Claims 1 and 2, respectfully, in addition to a server and some actions for performing the method steps of Claims 1 and 2, respectfully. Therefore, Claims 29 and

Art Unit: 2161

30 are rejected for the same reasons as stated above with respect to Claims 1 and 2, respectfully.

37. **Claim 31** can be mapped to Lomet (as modified by Lehman) as follows: "A server according to claim 29, further comprising:

- an allocation layer object for said B-link tree; [Lomet, col. 5, lines 31-45 with Lomet, Fig. 3] and
- a B-link tree layer object, [Lomet, col. 5, lines 31-45 with Lomet, Fig. 3]
- wherein said at least one log entry includes at least one of (A) at least one entry from the allocation layer object and (B) at least one entry from the B-link tree layer object" [Lomet, col. 19, lines 35-37 with Lehman, p. 657, section 3.3].

38. **Claims 32-37** encompass substantially the same scope of the invention as that of Claims 4-9, respectfully, in addition to a server and some actions for performing the method steps of Claims 4-9, respectfully. Therefore, Claims 32-37 are rejected for the same reasons as stated above with respect to Claims 4-9, respectfully.

39. **Claim 38** encompasses substantially the same scope of the invention as that of Claim 12, in addition to a server and some objects for performing the method steps of Claim 12. Therefore, Claim 38 is rejected for the same reasons as stated above with respect to Claim 12.

40. **Claim 39** can be mapped to Lomet (as modified by Lehman) as follows: "A server according to claim 38, further including:

- an allocation layer and a B-link tree layer, [Lomet, col. 5, lines 31-45 with Lomet, Fig. 3] wherein said at least one log entry includes at least one (A) at least one

entry from the allocation layer and (B) at least one entry from the B-link tree layer" [Lomet, col. 19, lines 35-37 with Lehman, p. 657, section 3.3].

41. **Claims 40-45** encompass substantially the same scope of the invention as that of Claims 14-19, respectfully, in addition to a server and some objects for performing the method steps of Claims 14-19, respectfully. Therefore, Claims 40-45 are rejected for the same reasons as stated above with respect to Claims 14-19, respectfully.

42. **Claims 51 and 52** encompass substantially the same scope of the invention as that of Claims 1 and 2, respectfully, in addition to a computing device and some means for performing the method steps of Claims 1 and 2, respectfully. Therefore, Claims 51 and 52 are rejected for the same reasons as stated above with respect to Claims 1 and 2, respectfully.

43. **Claims 53 and 54** encompass substantially the same scope of the invention as that of Claims 12 and 14, respectfully, in addition to a computing device and some means for performing the method steps of Claims 12 and 14, respectfully. Therefore, Claims 53 and 54 are rejected for the same reasons as stated above with respect to Claims 12 and 14, respectfully.

44. Claims 22, 23, 26-28, 46, 47, 50, 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,485,608 (Lomet et al.) in view of U.S. Patent No. 5,434,994 (Shaheen et al.).

45. For **Claim 22**, Lomet teaches: "A method for logging while updating a data structure via a plurality of data transactions, [Lomet, col. 7, lines 26-34] whereby a

Art Unit: 2161

current state of the data structure is recovered by re-performing data transactions represented by the logging, [Lomet, col. 20, lines 36-44 with Lomet, col. 21, lines 40-50] comprising:

- ...generating at least one log entry corresponding to a data transaction of the plurality of data transactions, the data transaction to be carried out on said data structure; [Lomet, col. 22, lines 25-30 with Lomet, col. 19, lines 35-37] and
- ...where the log is partitioned into an upper layer and an allocation layer, [Lomet, col. 5, lines 31-45 with Lomet, Fig. 3] ... wherein the single log includes log entries from both the upper layer and allocation layer” [Lomet, col. 5, lines 15-22 with Lomet, Fig. 3].

Lomet discloses the above limitations but does not expressly teach:

- “...replicating updates to the data structure to a first server location and a second server location;
- ...maintaining a single log... at each of said first and second server locations.”

With respect to Claim 22, an analogous art, Shaheen, teaches:

- “...replicating updates to the data structure to a first server location and a second server location; [Shaheen, col. 7, lines 50-55]
- ...maintaining a single log... at each of said first and second server locations” [Shaheen, col. 4, lines 62-66].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Shaheen with Lomet because both inventions are directed towards recovering data upon failure.

Shaheen's invention would have been expected to successfully work well with Lomet's invention because both inventions use computers using logs. Lomet discloses methods and an apparatus for updating information in a computer system using logs and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet does not expressly disclose replicating data on multiple servers, or maintaining a single log on those servers. Shaheen discloses a system and method for maintaining replicated data coherency in a data processing system comprising replicating data and logs across multiple servers.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the replication of data and logs across multiple servers from Shaheen and install it into the invention of Lomet, thereby offering the obvious advantage of making Lomet distributed to increase the availability and reliability of distributed systems of Lomet.

46. **Claim 23** can be mapped to Lomet (as modified by Shaheen) as follows: "A method according to claim 22, further including recovering the data structure after a failure by performing parallel recovery operations by each of said first and second server locations" [Shaheen, col. 4, lines 60-66 with Shaheen, col. 7, lines 49-57].

47. **Claim 26** can be mapped to Lomet (as modified by Shaheen) as follows: "A method according to claim 22, wherein the allocator layer handles at least one of (A) an allocate disk space operation, (B) a deallocate disk space operation, (C) a read from the allocated disk space operation and (D) a write to the allocated disk space operation" [Lomet, col. 5, lines 31-38].

Art Unit: 2161

48. **Claim 27** encompasses substantially the same scope of the invention as that of Claim 22, in addition to computer readable medium and some executable instructions for performing the method steps of Claim 22. Therefore, Claim 27 is rejected for the same reasons as stated above with respect to Claim 22.

49. **Claim 28** encompasses substantially the same scope of the invention as that of Claim 22, in addition to a modulated data signal and some executable instructions for performing the method steps of Claim 22. Therefore, Claim 28 is rejected for the same reasons as stated above with respect to Claim 22.

50. **Claims 46, 47, and 50** encompass substantially the same scope of the invention as that of Claims 22, 23, and 26, respectfully, in addition to a server and some objects for performing the method steps of Claims 22, 23, and 26, respectfully. Therefore, Claims 46, 47, and 50 are rejected for the same reasons as stated above with respect to Claims 22, 23, and 26, respectfully.

51. **Claims 55 and 56** encompass substantially the same scope of the invention as that of Claims 22 and 23, respectfully, in addition to a computing device and some means for performing the method steps of Claims 22 and 23, respectfully. Therefore, Claims 55 and 56 are rejected for the same reasons as stated above with respect to Claims 22 and 23, respectfully.

52. Claims 24, 25, 48, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,485,608 (Lomet et al.) in view of U.S. Patent No.

Art Unit: 2161

5,434,994 (Shaheen et al.), further in view of Efficient Locking for Concurrent Operations on B-Trees (Lehman et al.).

53. For **Claim 24**, Lomet (as modified by Shaheen) teaches: "A method according to claim 22."

Lomet (as modified by Shaheen) discloses the above limitation but does not expressly teach:

- "...wherein said data structure is a B-link tree."

With respect to Claim 24, an analogous art, Lehman, teaches:

- "...wherein said data structure is a B-link tree" [Lehman, p. 657, section 3.3].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Lehman with Lomet (as modified by Shaheen) because both inventions are directed towards storing information in a database.

Lehman's invention would have been expected to successfully work well with Lomet (as modified by Shaheen)'s invention because both inventions use databases. Lomet (as modified by Shaheen) discloses methods and an apparatus for updating information in a computer system using logs and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet (as modified by Shaheen) does not expressly disclose the use of a B-link-tree to store the data in the database of Lomet (as modified by Shaheen). Lehman discloses efficient locking for concurrent operations on B-trees comprising a B-link-tree.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the b-link-tree from Lehman and install it into the invention of Lomet

Art Unit: 2161

(as modified by Shaheen), thereby offering the obvious advantage of a guaranteed small (average) search, insertion, and deletion time for the database of Lomet (as modified by Shaheen).

54. **Claim 25** can be mapped to Lomet (as modified by Shaheen) as follows: "A method according to claim 24, wherein the upper layer is a B-link tree layer that handles B-link tree operations" [Lomet, col. 5, lines 39-44].

55. **Claims 48 and 49** encompass substantially the same scope of the invention as that of Claims 24 and 25, respectfully, in addition to a server and some objects for performing the method steps of Claims 24 and 25, respectfully. Therefore, Claims 48 and 49 are rejected for the same reasons as stated above with respect to Claims 24 and 25, respectfully.

Art Unit: 2161

Conclusion

56. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is advised that, although not used in the rejections above, prior art cited on the PTO-892 form and not relied upon is considered materially relevant to the applicant's claimed invention and/or portions of the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent S. Stace whose telephone number is 571-272-8372 and fax number is 571-273-8372. The examiner can normally be reached on M-F 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on 571-272-4023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brent Stace


SAFET METJAHIC
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100